Source: *An Introduction to Language* by Victoria Fromkin and Robert Rodman, 6th Ed.)

Part One: Introduction to Linguistics

Every human knows at least one language, spoken or signed. Linguistics is the science of language, including the sounds, words, and grammar rules. Words in languages are finite, but sentences are not. It is this creative aspect of human language that sets it apart from animal languages, which are essentially responses to stimuli.

The rules of a language, also called grammar, are learned as one acquires a language. These rules include **phonology**, the sound system, **morphology**, the structure of words, **syntax**, the combination of words into sentences, **semantics**, the ways in which sounds and meanings are related, and the **lexicon**, or mental dictionary of words. When you know a language, you know words in that language, i.e. sound units that are related to specific meanings. However, the sounds and meanings of words are arbitrary. For the most part, there is no relationship between the way a word is pronounced (or signed) and its meaning.

Knowing a language encompasses this entire system, but this knowledge (called **competence**) is different from behavior (called **performance**.) You may know a language, but you may also choose to not speak it. Although you are not speaking the language, you still have the knowledge of it. However, if you don't know a language, you cannot speak it at all.

There are two types of grammars: descriptive and prescriptive. **Descriptive grammars** represent the unconsciousknowledge of a language. English speakers, for example, know that "me likes apples" is incorrect and "I like apples" is correct, although the speaker may not be able to explain why. Descriptive grammars do not teach the rules of a language, but rather describe rules that are already known. In contrast, **prescriptive grammars** dictate what a speaker's grammar should be and they include teaching grammars, which are written to help teach a foreign language.

There are about 5,000 languages in the world right now (give or take a few thousand), and linguists have discovered that these languages are more alike than different from each other. There are universal concepts and properties that are shared by all languages, and these principles are contained in the **Universal Grammar**, which forms the basis of all possible human languages.

Part Two: Morphology and Syntax

Morphemes are the minimal units of words that have a meaning

and cannot be subdivided further. There are two main types: free and bound. Free morphemes can occur alone and bound morphemes must occur with another morpheme. An example of a free morpheme is "bad", and an example of a bound morpheme is "ly." It is bound because although it has meaning, it cannot stand alone. It must be attached to another morpheme to produce a word.
Free morpheme: bad
Bound morpheme: ly
Word: badly
When we talk about words, there are two groups: **lexical** (or content) and **function** (or grammatical) words. Lexical words are called open class words and include nouns, verbs, adjectives and adverbs. New words can regularly be added to this group. Function words, or closed class words, are conjunctions, prepositions, articles and pronouns; and new words cannot be (or are very rarely) added to this class.
Affixes are often the bound morpheme. This group includes **prefixes, suffixes, infixes,** and **circumfixes**. Prefixes are added to the beginning of another morpheme, suffixes are added to the end, infixes are inserted into other morphemes, and circumfixes are attached to another morpheme at the beginning and end. Following are examples of each of these:
Prefix: re- added to *do* produces *redo*
Suffix: -or added to *edit* produces *editor*
Infix: -um- added to *fikas* (strong) produces *fumikas* (to be strong) in Bontoc
Circumfix: ge- and -t to *lieb* (love) produces *geliebt* (loved) in German
There are two categories of affixes: **derivational and inflectional**. The main difference between the two is that derivational affixes are added to morphemes to form new words that may or may not be the same part of speech and inflectional affixes are added to the end of an existing word for purely grammatical reasons. In English there are only eight total inflectional affixes:

-s	3rd person singular present	she waits
-ed	past tense	she waited
-ing	progressive	she's eating
-en	past participle	she has eaten
-s	plural	three apples

-'s	possessive	Lori's son
-er	comparative	you are taller
-est	superlative	you are the shortest

The other type of bound morphemes are called bound roots. These are morphemes (and not affixes) that must be attached to another morpheme and do not have a meaning of their own. Some examples are *ceive* in perceive and *mit* in submit.

English Morphemes

- A. Free
  - 1. Open Class
  - 2. Closed Class
- B. Bound
  - 1. Affix
    - a. Derivational
    - b. Inflectional
  - 2. Root

There are six ways to form new words. **Compounds** are a combination of words, **acronyms** are derived from the initials of words, **back-formations** are created from removing what is mistakenly considered to be an affix,**abbreviations or clippings** are shortening longer words, **eponyms** are created from proper nouns (names), and**blending** is combining parts of words into one.

Compound: *doghouse*
Acronym: *NBA* (National Basketball Association) or *scuba* (self-contained underwater breathing apparatus)
Back-formation: *edit* from *editor*
Abbreviation: *phone* from *telephone*
Eponym: *sandwich* from *Earl of Sandwich*
Blending: *smog* from *smoke and fog*

Grammar is learned unconsciously at a young age. Ask any five year old, and he will tell you that "I eat" and "you eat," but his "dog eats." But a human's syntactical knowledge goes farther than what is grammatical and what is not. It also accounts for ambiguity, in which a sentence could have two meanings, and enables us to determine grammatical relationships such as subject and direct object. Although we may not consciously be able to define the terms, we unconsciously know how to use them in sentences. Syntax, of course, depends on lexical categories (parts of speech.) You probably learned that there are 8 main parts of speech in grammar school. Linguistics takes a different approach to these categories and separates words into morphological and syntactic

groups. Linguistics analyzes words according to their affixes and the words that follow or precede them. Hopefully, the following definitions of the parts of speech will make more sense and be of more use than the old definitions of grammar school books.

Open Class Words

Nouns	_____ + plural endings "dogs"	Det. Adj. _____ (this is called a Noun Phrase) "the big dog"
Verbs	____ + tense endings "speaks"	Aux. ____ (this is called a Verb Phrase) "have spoken"
Adjectives	____ + er / est "small"	Det. ____ Noun "the smaller child"
Adverbs	Adj. + ly "quickly"	____ Adj. or Verb or Adv. "quickly ran"

Closed Class Words

Determiners	a, an, the, this, that, these, those, pronouns, quantities	____ Adj. Noun "this blue book"
Auxiliary Verbs	forms of be, have, may, can, shall	NP ____ VP "the girl is swimming"
Prepositions	at, in, on, under, over, of	____ NP (this is called a Prepositional Phrase) "in the room"
Conjunctions	and, but, or	N or V or Adj. ____ N or V or Adj. "apples and oranges"

Subcategorization defines the restrictions on which syntactic categories (parts of speech) can or cannot occur within a lexical item. These additional specifications of words are included in our mental lexicon. Verbs are the most common categories that are subcategorized. Verbs can either be transitive or intransitive. **Transitive verbs** take a direct object, while **intransitive verbs** take an indirect object (usually they need a preposition before the noun).

Transitive verb: to eat	I ate an apple. (direct object)
Intransitive: to sleep	I was sleeping in the bed. (indirect object)

Individual nouns can also be subcategorized. For example, the

noun *idea* can be followed by a Prepositional Phrase or *that* and a sentence. But the noun *compassion* can only be followed by a Prepositional Phrase and not a sentence. (Ungrammatical sentences are marked with asterisks.)

the idea of stricter laws	his compassion for the animals
the idea that stricter laws are necessary	*his compassion that the animals are hurt

Phrase structure rules describe how phrases are formed and in what order. These rules define the following:

Noun Phrase (NP)	(Det.) (Adj.) Noun (PP)
Verb Phrase (VP)	Verb (NP) (PP)
Prepositional Phrase (PP)	Prep. NP
Sentence (S)	NP VP

The parentheses indicate the categories are optional. Verbs don't always have to be followed by prepositional phrases and nouns don't always have to be preceded by adjectives.

Passive Sentences

The difference between the two sentences "Mary hired Bill" and "Bill was hired by Mary" is that the first is active and the second is passive. In order to change an active sentence into a passive one, the object of the active must become the subject of the passive. The verb in the passive sentence becomes a form of "be" plus the participle form of the main verb. And the subject of the active becomes the object of the passive preceded by the word "by."

Active	Passive
Mary hired Bill.	Bill was hired by Mary.
Subject + Verb + Object	Object + "be" + Verb + by + Subject

Part Three: Phonetics and Phonology

There are three types of the study of the sounds of language. **Acoustic Phonetics** is the study of the physical properties of sounds. **Auditory Phonetics** is the study of the way listeners perceive sounds. **Articulatory Phonetics** (the type this lesson is concerned with) is the study of how the vocal tracts produce the sounds.

The orthography (spelling) of words in misleading, especially in English. One sound can be represented by several different combinations of letters. For example, all of the following words

contain the same vowel sound: h*e*, bel*ie*ve, L*ee*, C*ae*sar, k*ey*, am*oe*ba, loudl*y*, mach*i*ne, p*eo*ple, and s*ea*. The following poem illustrates this fact of English humorously (note the pronunciation of the bold words):

I take it you
already **know** of **tough** and **bough** and **cough** and **dough**?
Some may stumble, but not **you**, on **hiccough**, **thorough**, **slough**, and **through**?
So now you are ready, perhaps, to learn of less familiar traps?
Beware of **heard**, a dreadful **word**, that looks like **beard**, but sounds like **bird**.
And **dead**, it's **said** like **bed**, not **bead**; for goodness' sake, don't call it **deed**!
Watch out for **meat** and **great** and **threat**. (They rhyme
with **suite** and **straight** and **debt**.)
A **moth** is not a moth in **mother**,
nor **both** in **bother**, **broth** in **brother**.
And **here** is not a match for **there**, nor **dear** and **fear**,
for **bear** and **pear**.
And then there's **dose** and **rose** and **lose** - just look them up -
and **goose** and **choose**
And **cork** and **work** and **card** and **ward** and **font** and **front** and **w ord** and **sword**
And **do** and **go**, then **thwart** and **cart**, come, come! I've hardly made a start.
A dreadful language? Why man alive! I've learned to talk it when I was five.
And yet to write it, the more I tried, I hadn't learned it at fifty-five.
- Author Unknown

The discrepancy between spelling and sounds led to the formation of the **International Phonetics Alphabet** (IPA.) The symbols used in this alphabet can be used to represent all sounds of all human languages. The following is the English Phonetic alphabet. You might want to memorize all of these symbols, as most foreign language dictionaries use the IPA.

Phonetic Alphabet for English Pronunciation

p	**p**ill	d	**d**ill	h	**h**ea l	ʌ	b**u**t
b	**b**ill	n	**n**eal	l	**l**eaf	aj	l**ig h**t
m	**m**ill	s	**s**eal	r	**r**ee f	ɔj	b**oy**

f	**f**eel	z	**z**eal	j	**y**ou	ɪ	b**i**t
v	**v**ea l	č	**ch**ill	w	**w**it ch	ɛ	b**e**t
θ	**th**i gh	ǰ	**J**ill	i	b**ee** t	ʊ	f**oo** t
ð	**th**y	ʍ	**wh**i ch	e	b**ai** t	ɔ	aw e
š	**sh**il l	k	**k**ill	u	b**oo** t	a	b**a**r
ž	a**z**u re	g	**g**ill	o	b**oa** t	ə	sof **a**
t	**t**ill	ŋ	ri**ng**	æ	b**a**t	a w	c**o** **w**

Some speakers of English pronounce the words which and witch differently, but if you pronounce both words identically, just use w for both words. And the sounds /ʌ/ and /ə/ are pronounced the same, but the former is used in stressed syllables, while the latter is used in unstressed syllables. This list does not even begin to include all of the phonetic symbols though. One other symbol is the glottal stop, ʔ which is somewhat rare in English. Some linguists in the United States traditionally use different symbols than the IPA symbols. These are listed below.

U.S.	IPA
š	ʃ
ž	ʒ
č	tʃ
ǰ	dʒ
U	ʊ

The production of any speech sound involves the movement of air. Air is pushed through the lungs, larynx (vocal folds) and vocal tract (the oral and nasal cavities.) Sounds produced by using air from the lungs are called **pulmonic** sounds. If the air is pushed out, it is called **egressive**. If the air is sucked in, it is called **ingressive**. Sounds produced by ingressive airstreams are ejectives, implosives, and clicks. These sounds are common among African and American Indian languages. The majority of languages in the world use pulmonic egressive airstream mechanisms, and I will present only these types of sounds in this lesson.

Consonants

Consonants are produced as air from the lungs is pushed through the glottis (the opening between the vocal cords) and out the mouth. They are classified according to voicing, aspiration, nasal/oral sounds, places of articulation and manners of articulation. **Voicing** is whether the vocal folds vibrate or not. The sound /s/ is called voiceless because there is no vibration, and the sound /z/ is called voiced because the vocal folds do vibrate (you can feel on your neck if there is vibration.) Only three sounds in English have aspiration, the sounds /b/, /p/ and /t/. An extra puff of air is pushed out when these sounds begin a word or stressed syllable. Hold a piece of paper close to your mouth when saying the words pin and spin. You should notice extra air when you say pin. Aspiration is indicated in writing with a superscript h, as in /p^h/. Nasal sounds are produced when the velum (the soft palate located in the back of the roof of the mouth) is lowered and air is passed through the nose and mouth. Oral sounds are produced when the velum is raised and air passes only through the mouth.

Places of Articulation

Bilabial: lips together
Labiodental: lower lip against front teeth
Interdental: tongue between teeth
Alveolar: tongue near alveolar ridge on roof of mouth (in between teeth and hard palate)
Palatal: tongue on hard palate
Velar: tongue near velum
Glottal: space between vocal folds
The following sound is not found in the English language, although it is common in languages such as French and Arabic:
Uvular: raise back of tongue to uvula (the appendage hanging down from the velum)

Manners of Articulation

Stop: obstruct airstream completely
Fricative: partial obstruction with friction
Affricate: stop airstream, then release
Liquids: partial obstruction, no friction
Glides: little or no obstruction, must occur with a vowel
You should practice saying the sounds of the English alphabet to see if you can identify the places of articulation in the mouth. The sounds are described by voicing, place and then manner of articulation, so the sound /j/ would be called a voiced palatal glide and the sound /s/ would be called a voiceless alveolar fricative.

	Bilabial	Labiodental	Interdental	Alveolar	Palatal	Velar	Glottal

Stop (oral)	p b			t d		k g	
Nasal (stop)	m			n		ŋ	
Fricative		f v	θ ð	s z	š ž		h
Affricate					č ǰ		
Glide	ʍ w				j	ʍ w	h
Liquid				l r			

For rows that have two consonants, the top consonant is voiceless and the bottom consonant is voiced. Nasal stops are all voiced, as are liquids. The sound /j/ is also voiced. If sounds are in two places on the chart, that means they can be pronounced either way.

Vowels

Vowels are produced by a continuous airstream and all are voiced. They are classified according to height of the tongue, part of tongue involved, and position of the lips. The tongue can be high, mid, or low; and the part of the tongue used can be front, central or back. Only four vowels are produced with rounded lips and only four vowels are considered tense instead of lax. The sound /a/ would be written as a low back lax unrounded vowel. Many languages also have vowels called diphthongs, a sequence of two sounds, vowel + glide. Examples in English include *oy* in boy and *ow* in cow. In addition, vowels can be nasalized when they occur before nasal consonants. A diacritic mark [~] is placed over the vowel to show this. The vowel sounds in *bee* and *bean* are considered different because the sound in bean is nasalized.

		Part of Tongue		
		Front	Central	Back
Tongue Height	High	**i** ɪ		**u** ʊ
	Mid	**e** ɛ	ə ʌ	**o** ɔ
	Low	æ		a

The bold vowels are tense, and the italic vowels are rounded. English also includes the diphthongs: [aj] as in bite, [aw] as in cow, and [oj] as in boy.

For the complete IPA chart with symbols for the sounds of every human language, please visit the **International Phonetic Association's website**. And you're looking for a way to type English IPA symbols online, please visit**ipa.typeit.org**

Major Classes of Sounds (Distinctive Features)

All of the classes of sounds described above can be put into more general classes that include the patterning of sounds in the world's languages. **Continuant** sounds indicate a continuous airflow, while **non-continuant** sounds indicate total obstruction of the airstream. **Obstruent** sounds do not allow air to escape through the nose, while **sonorant** sounds have a relatively free airflow through the mouth or nose. The following table summarizes this information:

	Obstruent	Sonorant
Continuant	fricatives	liquids, glides, vowels
Non-Continuant	oral stops, affricates	nasal stops

Major Class Features
[+ Consonantal] consonants
[- Consonantal] vowels
[+Sonorant] nasals, liquids, glides, vowels
[- Sonorant] stops, fricatives, affricates (obstruents)
[+ Approximant] glides [j, w]
[- Approximant] everything else
Voice Features
[+ Voice] voiced
[- Voice] voiceless
[+ Spread Glottis] aspirated [pʰ, tʰ, kʰ]
[- Spread Glottis] unaspirated
[+ Constricted Glottis] ejectives, implosives
[- Constricted Glottis] everything else
Manner Features
[+ Continuant] fricatives [f, v, s, z, š, ž, θ, ð]
[- Continuant] stops [p, b, t, d, k, g, ʔ]
[+ Nasal] nasal consonants [m, n, ŋ]
[- Nasal] all oral consonants
[+ Lateral] [l]
[- Lateral] [r]
[+ Delayed Release] affricates [č, ǰ]
[- Delayed Release] stops [p, b, t, d, k, g, ʔ]
[+ Strident] “noisy” fricatives [f, v, s, z, š, ž]
[- Strident] [?, ð, h]

Place Features
[Labial] involves lips [f, v, p, b, w]
[Coronal] alveolar ridge to palate [θ, ð, s, z, t, d, š, ž, n, r, l]
[+ Anterior] interdentals and true alveolars
[- Anterior] retroflex and palatals [š, ž, č, ǰ, j]
[Dorsal] from velum back [k, g, ŋ]
[Glottal] in larynx [h, ʔ]
Vowels
Height [± high] [± low]
Backness [± back]
Lip Rounding [± round]
Tenseness [± tense]
Whereas phonetics is the study of sounds and is concerned with the production, audition and perception of of speech sounds (called phones), **phonology** describes the way sounds function within a given language and operates at the level of sound systems and abstract sound units. Knowing the sounds of a language is only a small part of phonology. This importance is shown by the fact that you can change one word into another by simply changing one sound. Consider the differences between the words time and dime. The words are identical except for the first sound. [t] and [d] can therefore distinguish words, and are called **contrasting sounds**. They are distinctive sounds in English, and all distinctive sounds are classified as **phonemes**.

Minimal Pairs

Minimal pairs are words with different meanings that have the same sounds except for one. These contrasting sounds can either be consonants or vowels. The words pin and bin are minimal pairs because they are exactly the same except for the first sound. The words read and rude are also exactly the same except for the vowel sound. The examples from above, time and dime, are also minimal pairs. In effect, words with one contrastive sound are minimal pairs. Another feature of minimal pairs is overlapping distribution. Sounds that occur in phonetic environments that are identical are said to be in overlapping distribution. The sounds of [ɪn] from pin and bin are in overlapping distribution because they occur in both words. The same is true for three and through. The sounds of [θr] is in overlapping distribution because they occur in both words as well.

Free Variation

Some words in English are pronounced differently by different speakers. This is most noticeable among American English speakers and British English speakers, as well as dialectal differences. This is evidenced in the ways neither, for example, can

be pronounced. American English pronunciation is [niðər], while British English pronunciation is [najðər].

Phones and Allophones

Phonemes are not physical sounds. They are abstract mental representations of the phonological units of a language.**Phones** are considered to be any single speech sound of which phonemes are made. Phonemes are a family of phones regarded as a single sound and represented by the same symbol. The different phones that are the realization of a phoneme are called **allophones** of that phoneme. The use of allophones is not random, but rule-governed. No one is taught these rules as they are learned subconsciously when the native language is acquired. To distinguish between a phoneme and its allophones, I will use slashes // to enclose phonemes and brackets [] to enclose allophones or phones. For example, [i] and [ĩ] are allophones of the phoneme /i/; [ɪ] and [ɪ̃] are allophones of the phoneme /ɪ/.

Complementary Distribution

If two sounds are allophones of the same phoneme, they are said to be in complementary distribution. These sounds cannot occur in minimal pairs and they cannot change the meaning of otherwise identical words. If you interchange the sounds, you will only change the pronunciation of the words, not the meaning. Native speakers of the language regard the two allophones as variations of the same sound. To hear this, start to say the word cool (your lips should be pursed in anticipation of /u/ sound), but then say kill instead (with your lips still pursed.) Your pronunciation of kill should sound strange because cool and kill are pronounced with different allophones of the phoneme /k/.

Nasalized vowels are allophones of the same phoneme in English. Take, for example, the sounds in bad and ban. The phoneme is /æ/, however the allophones are [æ] and [æ̃]. Yet in French, nasalized vowels are not allophones of the same phonemes. They are separate phonemes. The words beau [bo] and bon [bõ] are not in complementary distribution because they are minimal pairs and have contrasting sounds. Changing the sounds changes the meaning of the words. This is just one example of differences between languages.

Phonological Rules

Assimilation: sounds become more like neighboring sounds, allowing for ease of articulation or pronunciation; such as vowels are nasalized before nasal consonants

- Harmony: non-adjacent vowels become more similar by sharing a feature or set of features (common in Finnish)
- Gemination: sound becomes identical to an adjacent sound

- Regressive Assimilation: sound on left is the target, and sound on right is the trigger
Dissimilation: sounds become less like neighboring sounds; these rules are quite rare, but one example in English is [fɪfθ] becoming [fɪft] (/f/ and /θ/ are both fricatives, but /t/ is a stop)
Epenthesis: insertion of a sound, e.g. Latin "homre" became Spanish "hombre"
- Prothesis: insertion of vowel sound at beginning of word
- Anaptyxis: vowel sound with predictable quality is inserted word-internally
- Paragoge: insertion of vowel sound at end of word
- Excrescence: consonant sound inserted between other consonants (also called stop-intrusion)
Deletion: deletion of a sound; e.g. French word-final consonants are deleted when the next word begins with a consonant (but are retained when the following word begins with a vowel)
- Aphaeresis: vowel sound deleted at beginning of word
- Syncope: vowel sound is deleted word-internally
- Apocope: vowel sound deleted at end of word
Metathesis: reordering of phonemes; in some dialects of English, the word asked is pronounced [æks]; children's speech shows many cases of metathesis such as aminal for animal
Lenition: consonant changes to a weaker manner of articulation; voiced stop becomes a fricative, fricative becomes a glide, etc.
Palatalization: sound becomes palatal when adjacent to a front vowel Compensatory Lengthening: sound becomes long as a result of sound loss, e.g. Latin "octo" became Italian "otto"
Assimilation in English
An interesting observation of assimilation rules is evidenced in the formation of plurals and the past tense in English. When pluralizing nouns, the last letter is pronounced as either [s], [z], or [əz]. When forming past tenses of verbs, the -ed ending is pronounced as either [t], [d], [əd]. If you were to sort words into three columns, you would be able to tell why certain words are followed by certain sounds:

Plural nouns			Hopefully, you can determine which consonants produce which sounds. In the nouns, /s/ is added after voiceless consonants, and /z/ is added after voiced consonants. /əz/ is added after sibilants. For the verbs, /t/ is added after voiceless consonants, and /d/ is added after voiced consonants. /əd/ is added after alveolar stops. The great thing about this
/s/	/z/	/əz/	
cats	dads	churches	
tips	bibs	kisses	
laughs	dogs	judges	

Past Tense

/t/	/d/	/əd/
kissed	loved	patted
washed	jogged	waded
coughed	teased	seeded

is that no one ever taught you this in school. But thanks to linguistics, you now know why there are different sounds (because of assimiliation rules, the consonants become more like their neighboring consonants.)

Writing Rules

A general phonological rule is A → B / D __ E (said: A becomes B when it occurs between D and E) Other symbols in rule writing include: C = any obstruent, V = any vowel, Ø = nothing, # = word boundary, ( ) = optional, and { } = either/or. A deletion rule is A → Ø / E __ (A is deleted when it occurs after E) and an insertion rule is Ø → A / E __ (A is inserted when it occurs after E).

Alpha notation is used to collapse similar assimilation rules into one. C → [A voice] / __ [A voice] (An obstruent becomes voiced when it occurs before a voiced obstruent AND an obstruent becomes voiceless when it occurs before a voiceless obstruent.) Similarly, it can be used for dissimilation rules too. C → [-A voice] / __ [A voice] (An obstruent becomes voiced when it occurs before a voiceless obstruent AND an obstruent becomes voiceless when it occurs before a voiced obstruent.) Gemination rules are written as C1C2 → C2C2 (for example, pd → dd)

Syllable Structure

There are three peaks to a syllable: nucleus (vowel), onset (consonant before nucleus) and coda (consonant after nucleus.) The onset and coda are both optional, meaning that a syllable could contain a vowel and nothing else. The nucleus is required in every syllable by definition. The order of the peaks is always onset - nucleus - coda. All languages permit open syllables (Consonant + Vowel), but not all languages allow closed syllables (Consonant + Vowel + Consonant). Languages that only allow open syllables are called CV languages. In addition to not allowing codas, some CV languages also have constraints on the number of consonants allowed in the onset. The sonority profile dictates that sonority must rise to the nucleus and fall to the coda in every language. The sonority scale (from most to least sonorous) is vowels - glides - liquids - nasals - obstruents. Sonority must rise in the onset, but the sounds cannot be adjacent to or share a place of articulation (except [s] in English) nor can there be more than two consonants in the onset. This explains why English allows some consonant combinations,

but not others. For example, price [prajs] is a well-formed syllable and word because the sonority rises in the onset (p, an obstruent, is less sonorous than r, a liquid); however, rpice [rpajs] is not a syllable in English because the sonority does not rise in the onset. The Maximality Condition states that onsets are as large as possible up to the well-formedness rules of a language. Onsets are always preferred over codas when syllabifying words. There are also constraints that state the maximum number of consonants between two vowels is four; onsets and codas have two consonants maximally; and onsets and codas can be bigger only at the edges of words.

Part Four: Semantics and Pragmatics

Semantics

Lexical semantics is concerned with the meanings of words and the meaning of relationships among words, while phrasal semantics is concerned with the meaning of syntactic units larger than the word. Pragmatics is the study of how context affects meaning, such as how sentences are interpreted in certain situations.

Semantic properties are the components of meanings of words. For example, the semantic property "human" can be found in many words such as parent, doctor, baby, professor, widow, and aunt. Other semantic properties include animate objects, male, female, countable items and non-countable items.

The -nyms

Homonyms: different words that are pronounced the same, but may or may not be spelled the same (to, two, and too)

Polysemous: word that has multiple meanings that are related conceptually or historically (bear can mean to tolerate or to carry or to support)

Homograph: different words that are spelled identically and possibly pronounced the same; if they are pronounced the same, they are also homonyms (pen can mean writing utensil or cage)

Heteronym: homographs that are pronounced differently (dove the bird and dove the past tense of dive)

Synonym: words that mean the same but sound different (couch and sofa)

Antonym: words that are opposite in meaning

Complementary pairs: alive and dead

Gradable pairs: big and small (no absolute scale)

Hyponym: set of related words (red, white, yellow, blue are all hyponyms of "color")

Metonym: word used in place of another to convey the same meaning (jock used for athlete, Washington used for American

government, crown used for monarcy)
Retronym: expressions that are no longer redundant (silent movie used to be redundant because a long time ago, all movies were silent, but this is no longer true or redundant)

Thematic Roles

Thematic roles are the semantic relationships between the verbs and noun phrases of sentences. The following chart shows the thematic roles in relationship to verbs of sentences:

Thematic Role	Description	Example
Agent	the one who performs an action	*Maria* ran
Theme	the person or thing that undergoes an action	Mary called *John*
Location	the place where an action takes place	It rains *in Spain*
Goal	the place to which an action is directed	Put the cat *on the porch*
Source	the place from which an action originates	He flew from *Chicago* to LA
Instrument	the means by which an action is performed	He cuts his hair *with scissors*
Experiencer	one who perceives something	*She* heard Bob play the piano
Causative	a natural force that causes a change	*The wind* destroyed the house
Possessor	one who has something	The tail *of the cat* got caught
Recipient	one who receives something	I gave it to *the girl*

Sentential Meaning

The meaning of sentences is built from the meaning of noun phrases and verbs. Sentences contain truth conditions if the circumstances in the sentence are true. Paraphrases are two sentences with the same truth conditions, despite subtle differences in structure and emphasis. The ball was kicked by the boy is a paraphrase of the sentence the boy kicked the ball, but they have the same truth conditions - that a boy kicked a ball. Sometimes the truth of one sentence entails or implies the truth of another sentence. This is called entailment and the opposite of this is called contradiction, where one sentence implies the falseness of another. *He was assassinated* entails that he is dead. *He was assassinated*contradicts with the statement *he is alive*.

Pragmatics

Pragmatics is the interpretation of linguistic meaning in context. Linguistic context is discourse that precedes a sentence to be interpreted and situational context is knowledge about the world. In the following sentences, *the kids have eaten already* and *surprisingly, they are hungry*, the linguistic context helps to interpret the second sentence depending on what the first sentence says. The situational context helps to interpret the second sentence because it is common knowledge that humans are not usually hungry after eating.

Maxims of Conversation

Grice's maxims for conversation are conventions of speech such as the **maxim of quantity** that states a speaker should be as informative as is required and neither more nor less. The **maxim of relevance** essentially states a speaker should stay on the topic, and the **maxim of manner** states the speaker should be brief and orderly, and avoid ambiguity. The fourth maxim, the **maxim of quality**, states that a speaker should not lie or make any unsupported claims.

Performative Sentences

In these types of sentences, the speaker is the subject who, by uttering the sentence, is accomplishing some additional action, such as daring, resigning, or nominating. These sentences are all affirmative, declarative and in the present tense. An informal test to see whether a sentence is performative or not is to insert the words *I hereby* before the verb. *I hereby challenge you to a match* or *I hereby fine you $500* are both performative, but *I hereby know that girl* is not. Other performative verbs are bet, promise, pronounce, bequeath, swear, testify, and dismiss.

Presuppositions

These are implicit assumptions required to make a sentence meaningful. Sentences that contain presuppositions are not allowed in court because accepting the validity of the statement mean accepting the presuppositions as well. *Have you stopped stealing cars?* is not admissible in court because no matter how the defendant answers, the presupposition that he steals cars already will be acknowledged. *Have you stopped smoking?* implies that you smoke already, and *Would you like another piece?* implies that you've already had one piece.

Deixis

Deixis is reference to a person, object, or event which relies on the situational context. First and second person pronouns such as my, mine, you, your, yours, we, ours and us are always deictic because their reference is entirely dependent on context. Demonstrative

articles like this, that, these and those and expressions of time and place are always deictic as well. In order to understand what specific times or places such expressions refer to, we also need to know when or where the utterance was said. If someone says "I'm over here!" you would need to know who "I" referred to, as well as where "here" is. Deixis marks one of the boundaries of semantics and pragmatics.

Part Five: Neurolinguistics

The human brain consists of 10 billion nerve cells (neurons) and billions of fibers that connect them. These neurons or gray matter form the **cortex**, the surface of the brain, and the connecting fibers or white matter form the interior of the brain. The brain is divided into two hemispheres, the left and right cerebral hemispheres. These hemispheres are connected by the **corpus callosum**. In general, the left hemisphere of the brain controls the right side of the body and vice versa.

The **auditory cortex** receives and interprets auditory stimuli, while the **visual cortex** receives and interprets visual stimuli. The **angular gyrus** converts the auditory stimuli to visual stimuli and vice versa. The **motor cortex** signals the muscles to move when we want to talk and is directed by Broca's area. The nerve fiber connecting Wernicke's and Broca's area is called the **arcuate fasciculus.**

Lateralization refers to any cognitive functions that are localized to one side of the brain or the other. Language is said to be lateralized and processed in the left hemisphere of the brain. Paul Broca first related language to the left side of the brain when he noted that damage to the front part of the left hemisphere (now called **Broca's area**) resulted in a loss of speech, while damage to the right side did not. He determined this through autopsies of patients who had acquired language deficits following brain injuries. A language disorder that follows a brain lesion is called **aphasia**, and patients with damage to Broca's area have slow and labored speech, loss of function words, and poor word order, yet good comprehension.

Carl Wernicke also used studies of autopsies to describe another type of aphasia that resulted from lesions in the back portion of the left hemisphere (now called **Wernicke's area**.) Unlike Broca's patients, Wernicke's spoke fluently and with good pronunciation, but with many lexical errors and a difficulty in comprehension. Broca's and Wernicke's area are the two main regions of the cortex

of the brain related to language processing.
Aphasics can suffer from **anomia, jargon aphasia,** and **acquired dyslexia**. Anomia is commonly referred to as "tip of the tongue" phenomenon and many aphasics experience word finding difficulty on a regular basis. Jargon aphasia results in the substitution of one word or sound for another. Some aphasics may substitute similar words for each other, such as table for chair, or they may substitute completely unrelated words, such as chair for engine. Others may pronounce table as sable, substituting an s sound for a t sound. Aphasics who became dyslexic after brain damage are called acquired dyslexics. When reading aloud words printed on cards, the patients produced the following substitutions:

Stimuli	Response One	Response Two
Act	Play	Play
South	East	West
Heal	Pain	Medicine

The substitution of phonologically similar words, such as pool and tool, also provides evidence that a human's mental lexicon is organized by both phonology and semantics.
Broca's aphasics and some acquired dyslexics are unable to read function words, and when presented with them on the cards, the patients say no, as shown in the following example:

Stimuli One	Response	Stimuli Two	Response
Witch	Witch	Which	no!
Hour	Time	Our	no!
Wood	Wood	Would	no!

The patient's errors suggest our mental dictionary is further organized into parts consisting of major content words (first stimuli) and grammatical words (second stimuli.)
In addition, split-brain patients (those who have had their corpus callosum severed) provide evidence for language lateralization. If an object is placed in the left hand of split-brain patient whose vision is cut off, the person cannot name the object, but will know how to use it. The information is sent to the right side of the brain, but cannot be relayed to the left side for linguistic naming. However, if the object is placed in the person's right hand, the person can immediately name it because the information is sent directly to the left hemisphere.
Dichotic listening is another experimental technique, using auditory signals. Subjects hear a different sound in each ear, such

as boy in the left ear and girl in the right ear or water rushing in the left ear and a horn honking in the right ear. When asked to state what they heard in each ear, subjects are more frequently correct in reporting linguistic stimuli in the right ear (girl) and nonverbal stimuli in the left ear (water rushing.) This is because the left side of the brain is specialized for language and a word heard in the right ear will transfer directly to the left side of the body because of the contralateralization of the brain. Furthermore, the right side of the brain is specialized for nonverbal stimuli, such as music and environmental sounds, and a noise heard in the left ear will transfer directly to the right side of the brain.

Part Six: Child Language Acquisition and Second Language Acquisition

Linguistic competence develops in stages, from babbling to one word to two word, then telegraphic speech. Babbling is now considered the earliest form of language acquisition because infants will produce sounds based on what language input they receive. One word sentences (holophrastic speech) are generally monosyllabic in consonant-vowel clusters. During two word stage, there are no syntactic or morphological markers, no inflections for plural or past tense, and pronouns are rare, but the intonation contour extends over the whole utterance. Telegraphic speech lacks function words and only carries the open class content words, so that the sentences sound like a telegram.

Three theories

The three theories of language acquisition: **imitation, reinforcement** and **analogy**, do not explain very well how children acquire language. Imitation does not work because children produce sentences never heard before, such as "cat stand up table." Even when they try to imitate adult speech, children cannot generate the same sentences because of their limited grammar. And children who are unable to speak still learn and understand the language, so that when they overcome their speech impairment they immediately begin speaking the language. Reinforcement also does not work because it actually seldomly occurs and when it does, the reinforcement is correcting pronunciation or truthfulness, and not grammar. A sentence such as "apples are purple" would be corrected more often because it is not true, as compared to a sentence such as "apples is red" regardless of the grammar. Analogy also cannot explain language acquisition. Analogy involves the formation of sentences or phrases by using other sentences as samples. If a child hears the sentence, "I painted a red barn," he can say, by analogy, "I painted a blue

barn." Yet if he hears the sentence, "I painted a barn red," he cannot say "I saw a barn red." The analogy did not work this time, and this is not a sentence of English.

Acquisitions

Phonology: A child's error in pronunciation is not random, but rule-governed. Typical phonological rules include: consonant cluster simplification (spoon becomes poon), devoicing of final consonants (dog becomes dok), voicing of initial consonants (truck becomes druck), and consonant harmony (doggy becomes goggy, or big becomes gig.)

Morphology: An overgeneralization of constructed rules is shown when children treat irregular verbs and nouns as regular. Instead of went as the past tense of go, children use *goed* because the regular verbs add an -ed ending to form the past tense. Similarly, children use gooses as the plural of goose instead of geese, because regular nouns add an -s in the plural.

The **"Innateness Hypothesis"** of child language acquisition, proposed by Noam Chomsky, states that the human species is prewired to acquire language, and that the kind of language is also determined. Many factors have led to this hypothesis such as the ease and rapidity of language acquisition despite impoverished input as well as the uniformity of languages. All children will learn a language, and children will also learn more than one language if they are exposed to it. Children follow the same general stages when learning a language, although the linguistic input is widely varied.

The **poverty of the stimulus** states that children seem to learn or know the aspects of grammar for which they receive no information. In addition, children do not produce sentences that could not be sentences in some human language. The principles of Universal Grammar underlie the specific grammars of all languages and determine the class of languages that can be acquired unconsciously without instruction. It is the genetically determined faculty of the left hemisphere, and there is little doubt that the brain is specially equipped for acquisition of human language.

The **"Critical Age Hypothesis"** suggests that there is a critical age for language acquisition without the need for special teaching or learning. During this critical period, language learning proceeds quickly and easily. After this period, the acquisition of grammar is difficult, and for some people, never fully achieved. Cases of children reared in social isolation have been used for testing the critical age hypothesis. None of the children who had little human contact were able to speak any language once reintroduced into

society. Even the children who received linguistic input after being reintroduced to society were unable to fully develop language skills. These cases of isolated children, and of deaf children, show that humans cannot fully acquire any language to which they are exposed unless they are within the critical age. Beyond this age, humans are unable to acquire much of syntax and inflectional morphology. At least for humans, this critical age does not pertain to all of language, but to specific parts of the grammar.

Second Language Acquisition Teaching Methods

Grammar-translation: the student memorizes words, inflected words, and syntactic rules and uses them to translate from native to target language and vice versa; most commonly used method in schools because it does not require teacher to be fluent; however, least effective method of teaching

Direct method: the native language is not used at all in the classroom, and the student must learn the new language without formal instruction; based on theories of first language acquisition

Audio-lingual: heavy use of dialogs and audio, based on the assumption that language learning is acquired mainly through imitation, repetition, and reinforcement; influenced by psychology

Natural Approach: emphasis on vocabulary and not grammar; focus on meaning, not form; use of authentic materials instead of textbook

Silent Way: teachers remain passive observers while students learn, which is a process of personal growth; no grammatical explanation or modeling by the teacher

Total Physical Response: students play active role as listener and performer, must respond to imperative drills with physical action

Suggestopedia: students always remain comfortable and relaxed and learn through memorization of meaningful texts, although the goal is understanding

Community Language Learning: materials are developed as course progresses and teacher understands what students need and want to learn; learning involves the whole person and language is seen as more than just communication

Community Language Teaching: incorporates all components of language and helps students with various learning styles; use of communication-based activities with authentic materials, needs of learner are taken into consideration when planning topics and objectives

Four skill areas

The four skill areas of learning a foreign language need to be addressed consistently and continually. Good lesson plans incorporate all four: Listening, Speaking, Reading (and

Vocabulary), and Writing (and Grammar). Native speakers do not learn the skill areas separately, nor do they use them separately, so they shouldn't be taught separately. However, it is easy to fall into the trap of teaching about the language, instead of actually teaching the language. Most textbooks resort to teaching grammar and vocabulary lists and nothing more.

Part Seven: Sociolinguistics

A **dialect** is a variety of language that is systematically different from other varieties of the same language. The dialects of a single language are mutually intelligible, but when the speakers can no longer understand each other, the dialects become languages. Geographical regions are also considered when dialects become languages. Swedish, Norwegian, and Danish are all considered separate languages because of regular differences in grammar and the countries in which they are spoken, yet Swedes, Norwegians, and Danes can all understand one another. Hindi and Urdu are considered mutually intelligible languages when spoken, yet the writing systems are different. On the other hand, Mandarin and Cantonese are mutually unintelligible languages when spoken, yet the writing systems are the same.

A dialect is considered standard if it is used by the upper class, political leaders, in literature and is taught in schools as the correct form of the language. Overt prestige refers to this dominant dialect. A non-standard dialect is associated with covert prestige and is an ethnic or regional dialect of a language. These non-standard dialects are just as linguistically sophisticated as the standard dialect, and judgments to the inferiority of them are based on social or racist judgments.

African-American English contains many regular differences of the standard dialect. These differences are the same as the differences among many of the world's dialects. Phonological differences include r and l deletion of words like poor (pa) and all (awe.) Consonant cluster simplification also occurs (passed pronounced like pass), as well as a loss of interdental fricatives. Syntactic differences include the double negative and the loss of and habitual use of the verb "be."*He late* means he is late now, but *he be late* means he is always late.

A **lingua franca** is a major language used in an area where speakers of more than one language live that permits communication and commerce among them. English is called the lingua franca of the whole world, while French used to be the lingua franca of diplomacy.

A **pidgin** is a rudimentary language of few lexical items and less

complex grammatical rules based on another language. No one learns a pidgin as a native language, but children do learn creoles as a first language. **Creoles** are defined as pidgins that are adopted by a community as its native tongue.
Besides dialects, speakers may use different **styles** or registers (such as contractions) depending on the context.**Slang** may also be used in speech, but is not often used in formal situations or writing. **Jargon** refers to the unique vocabulary pertaining to a certain area, such as computers or medicine. Words or expressions referring to certain acts that are forbidden or frowned upon are considered **taboo**. These taboo words produce **euphemisms**, words or phrases that replace the expressions that are being avoided.
The use of words may indicate a society's attitude toward sex, bodily functions or religious beliefs, and they may also reflect racism or sexism in a society. Language itself is not racist or sexist, but the society may be. Such insulting words may reinforce biased views, and changes in society may be reflected in the changes in language.

Part Eight: Historical Linguistics
Languages that evolve from a common source are genetically related. These languages were once dialects of the same language. Earlier forms of Germanic languages, such as German, English, and Swedish were dialects of Proto-Germanic, while earlier forms of Romance languages, such as Spanish, French, and Italian were dialects of Latin. Furthermore, earlier forms of Proto-Germanic and Latin were once dialects of Indo-European.
Linguistic changes like sound shift is found in the history of all languages, as evidenced by the regular sound correspondences that exist between different stages of the same language, different dialects, and different languages. Words, morphemes, and phonemes may be altered, added or lost. The meaning of words may broaden, narrow or shift. New words may be introduced into a language by borrowing, or by coinage, blends and acronyms. The lexicon may also shrink as older words become obsolete.
Change comes about as a result of the restructuring of grammar by children learning the language. Grammars seem to become simple and regular, but these simplifications may be compensated for by more complexities. Sound changes can occur because of **assimilation**, a process of ease of articulation. Some grammatical changes are **analogic changes**, generalizations that lead to more regularity, such as sweeped instead of swept.
The study of linguistic change is called historical and comparative

linguistics. Linguists identify regular sound correspondences using the comparative method among the cognates (words that developed from the same ancestral language) of related languages. They can restructure an earlier protolanguage and this allows linguists to determine the history of a language family.

Old English, Middle English, Modern English

Old English	499-1066 CE	Beowulf
Middle English	1066-1500 CE	Canterbury Tales
Modern English	1500-present	Shakespear e

Phonological change: Between 1400 and 1600 CE, the Great Vowel Shift took place. The seven long vowels of Middle English underwent changes. The high vowels [i] and [u] became the diphthongs [aj] and [aw]. The long vowels increased tongue height and shifted upward, and [a] was fronted. Many of the spelling inconsistencies of English are because of the Great Vowel Shift. Our spelling system still reflects the way words were pronounced before the shift took place.

Morphological change: Many Indo-European languages had extensive case endings that governed word order, but these are no longer found in Romance languages or English. Although pronouns still show a trace of the case system (he vs. him), English uses prepositions to show the case. Instead of the dative case (indirect objects), English usually the words *to* or *for*. Instead of the genitive case, English uses the word *of* or *'s* after a noun to show possession. Other cases include the nominative (subject pronouns), accusative (direct objects), and vocative.

Syntactic change: Because of the lack of the case system, word order has become more rigid and strict in Modern English. Now it is strictly Subject - Verb - Object order.

Orthographic change: Consonant clusters have become simplified, such as hlaf becoming loaf and hnecca becoming neck. However, some of these clusters are still written, but are no longer pronounced, such as gnaw, write, and dumb.

Lexical change: Old English borrowed place names from Celtic, army, religious and educational words from Latin, and everyday words from Scandinavian. Angle and Saxon (German dialects) form the basis of Old English phonology, morphology, syntax and lexicon. Middle English borrowed many words from French in the areas of government, law, religion, literature and education because of the Norman Conquest in 1066 CE. Modern English borrowed words from Latin and Greek because of the influence of the classics, with

much scientific terminology.
For more information, read the **History of English** page.

Part Nine: Classification of Languages
Indo-European family of languages
- Italic (Latin)
  - Romance
    - Catalan
    - French
    - Italian
    - Occitan (Provençal)
    - Portuguese
    - Rhaeto-Romansch
    - Romanian
    - Spanish
- Germanic
  - North Germanic
    - Danish
    - Faroese
    - Icelandic
    - Norwegian
    - Swedish
  - East Germanic
    - Gothic (extinct)
  - West Germanic
    - Afrikaans
    - Dutch
    - English
    - Flemish
    - Frisian
    - German
    - Yiddish
- Slavic
  - Western
    - Czech
    - Polish
    - Slovak
    - Sorbian
  - Eastern
    - Belarusian
    - Russian
    - Ukrainian
  - Southern
    - Bulgarian

- Croatian
- Macedonian
- Old Church Slavonic
- Serbian
- Slovene

- Baltic
  - Latvian
  - Lithuanian
  - Old Prussian (extinct)
- Celtic
  - Brythonic
    - Breton
    - Cornish (extinct)
    - Gaulish (extinct)
    - Welsh
  - Goidelic
    - Irish
    - Manx Gaelic (extinct)
    - Scots Gaelic
- Hellenic (Greek)
- Albanian
- Armenian
- Anatolian (extinct)
- Tocharian (extinct)
- Indo-Iranian
  - Indo-Aryan (Indic)
    - Assamese
    - Bengali
    - Bihari
    - Gujarati
    - Hindi-Urdu
    - Marathi
    - Punjabi
    - Romani
    - Sanskrit
    - Sindhi
    - Singhalese
  - Iranian
    - Avestan
    - Balochi
    - Farsi (Persian)
    - Kurdish
    - Pashtu (Afghan)
    - Sogdian

Uralic (or Finno-Ugric) is the other major family of languages spoken on the European continent. Finnish, Estonian and Hungarian are examples.
Afro-Asiatic languages are spoken in Northern Africa and the Middle East. They include Berber, Egyptian, Omotic and Cushitic languages (Somali, Iraqw) as well as the modern Semitic languages of Hebrew, Arabic and Amharic, in addition to languages spoken in biblical times, such as Aramaic, Akkadian, Babylonian, Canaanite, and Phoenician.
The **Altaic** languages are classified as Japanese and Korean, though some linguists separate these languages into their own groups.
Sino-Tibetan languages include Mandarin, Hakka, Wu, Burmese, Tibetan, and all of the Chinese "dialects."
Austro-tai languages include Indonesian, Javanese and Thai; while the **Asiatic** group includes Vietnamese.
The **Dravidian** languages of Tamil and Telugu are spoken in southeastern India and Sri Lanka.
The **Caucasian** language family consists of 40 different languages, and is divided into Cartvelian (south Caucasian), North-West Caucasian and North-East Caucasian language groups. Some languages are Georgian, Megrelian, Chechen, Ingush Avarian, Lezgian and Dargin. These languages are mostly spoken in Georgia, Turkey, Syria, Iran, Jordan and parts of the Russian federation.
The **Niger-Congo** family includes most of the African languages. About 1,500 languages belong to this group, including the Bantu languages of Swahili, Tswana, Xhosa, Zulu, Kikuyu, and Shona. Other languages are Ewe, Mina, Yoruba, Igbo, Wolof, Kordofanian and Fulfulde.
Other African language groups are **Nilo-Saharan**, which includes 200 languages spoken in Central and Eastern Africa; and **Khoisan**, the click languages of southern Africa. The Khoisan group only contains about 30 languages, most of which are spoken in Namibia and Botswana.
The **Austronesian** family also contains about 900 languages, spoken all over the globe. Hawaiian, Maori, Tagalog, and Malay are all representatives of this language family.
Many languages are, or were, spoken in North and South America by the native peoples before the European conquests. Knowledge of these languages is limited, and because many of the languages are approaching extinction, linguists have little hope of achieving a complete understanding of the **Amerindian** language families.